

ACTUARIAL VALUATION REPORT
FOR THE
CITY OF ATTLEBORO
CONTRIBUTORY RETIREMENT SYSTEM
AS OF
JANUARY 1, 2004

Prepared for: Mr. Gary S. Sagar
Chairman
Attleboro Retirement Board
Government Center
77 Park Street
Attleboro, MA 02703

May 12, 2004

John Hancock

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SUMMARY AND CERTIFICATION

This actuarial valuation report is prepared as of January 1, 2004 for the City of Attleboro, to develop a funding schedule for the Retirement System for the fiscal years ending in 2005, 2006 and 2007.

This Summary presents the basic results and describes the changes from the last actuarial valuation, which was performed by John Hancock as of January 1, 2001. The exhibits which follow contain the details supporting the calculations, the basic information used and the actuarial cost method and assumptions, as well as information for disclosure under GASB statement No. 25. At the end of the report we have included a comparative "Quick Reference" summary of principal valuation results, which includes results and projections from the prior actuarial valuation.

Pension Appropriation

The Appropriation consists of three components: Normal Cost (for the current year of service), amortization amount for the Unfunded Actuarial Accrued (Past Service) Liability, and an allowance for administrative expenses. Below we show the FY2005 Pension Appropriation, based on this year's actuarial valuation, and also the amounts projected from the 2001 calculations.

Pension Appropriation for the Fiscal Year Beginning July 1, 2004 (FY2005)

	<u>2004 Actuarial Valuation</u>	<u>Projected from 2001 Valuation</u>
Normal Cost	\$1,307,225	\$2,218,187
Amortization	2,863,953	2,054,039
Expenses	<u>128,850</u>	<u>205,492</u>
Pension Appropriation for FY2005	\$4,300,028	\$4,477,718

Analysis of the Change in Appropriation Amount

The FY2005 Pension Appropriation resulting from this year's valuation is approximately \$178,000 lower than had been projected in the valuation done in 2001. The change is the net result of several factors:

Actuarial Loss – Over the 3 years since the last actuarial valuation, there was a net actuarial loss of about \$4.7 million. This is the net effect of a large asset loss, offset partially by gains from other sources. This loss along with changes in Normal Cost related to experience, accounts for an increase in the Appropriation of \$380,000, compared to what had been projected in the last valuation.

Early Retirement Incentive – The City adopted an Early Retirement Incentive program in late 2003, which enabled 47 employees to retire early with enhanced pension benefits. This year's appropriation includes an amortization of the increase in Unfunded Actuarial Accrued Liability resulting from this program. However, the appropriation was also smaller than it otherwise would have been because of the Normal Cost that is no longer payable since these individuals are no longer active. The net effect was to increase the appropriation by about \$161,000 for FY2005.

Expenses – The City's estimate of administrative expenses has been refined to include only administrative and not investment expenses. (The figure used in the last valuation included a portion of the investment consulting and custodial expenses.) This results in an expense component of the appropriation which is about \$77,000 lower than had been projected in the last valuation.

Actuarial Assumptions – Based on PERAC's 2002 Local Experience Study Analysis, we modified many of the demographic assumptions. In particular, the mortality tables have been updated, the assumption for disablement has been reduced significantly, and salary increases and withdrawal rates are now based on service rather than age. The net effect of these changes has been to decrease the present value of total projected benefits by about 6%. Because of the operation of the actuarial cost method, there was a decrease of about 20% in the total Normal Cost, which, when leveraged against the Member Contributions, reduced the employer normal cost by 38%. Coupling this with a small (0.6%) decrease in Actuarial Accrued Liability, the net effect was to reduce the appropriation for FY2005 by \$824,000 from what it otherwise would have been.

Funding Schedule - The Board has decided to shorten the funding schedule from 24 to 22 years, and to lower the rate of increase in the amortization from 4.5% to 4.252%. This increased the FY2005 appropriation amount by \$182,000.

Actuarial Certification

The valuation was performed pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts. To the best of our knowledge, the information in this report and in the accompanying exhibits is complete and accurate, and in our opinion, the assumptions used in the determination of costs are reasonably related to the experience of the plan and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the plan.

In our opinion, this report represents an accurate appraisal of the actuarial status of the Attleboro Retirement System performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

If we can be of any further assistance regarding this valuation, please do not hesitate to contact us.

Respectfully submitted,

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Exhibit I

Basic Actuarial Valuation Results

Shown below are the Actuarial Accrued Liability and Total Normal Cost for the System, calculated as of January 1, 2004. From these we compute the Unfunded Actuarial Accrued Liability (which is used to derive the amortization amounts shown in Exhibit II), and the Employer Normal Cost (which is also a component of the Appropriation calculation, shown in Exhibit II).

	<u>Actuarial Accrued Liability</u>	<u>Normal Cost</u>
A. Active Members		
1. Superannuation	\$ 40,706,837	\$1,905,081
2. Death	1,645,382	236,193
3. Disability	3,609,185	538,918
4. Withdrawal	<u>(500,331)</u>	<u>299,621</u>
5. Total	\$ 45,461,073	\$2,979,813
 B. Nonactive Members		
1. Retired	\$ 48,224,893	
2. Disabled	10,422,520	
3. Terminated Vested	921,977	
4. Terminated Non-vested	<u>310,003</u>	
5. Total	\$ 59,879,393	
 C. Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2004		
1. Total Actuarial Accrued Liability (A.5 + B.5)	\$105,340,466	
2. Valuation Assets (Exhibit IV)	<u>66,028,724</u>	
3. Unfunded Actuarial Accrued Liability (C.1 - C.2)	\$ 39,311,742	
4. Funded Ratio (C.2 / C.1)		62.7%

Exhibit I (continued)

Basic Actuarial Valuation Results

	<u>Actuarial Accrued Liability</u>	<u>Normal Cost</u>
D. Employer Normal Cost		
1. Total Normal Cost as of January 1, 2004 (A.5)		\$2,979,813
2. Anticipated Member Contributions for 2004		<u>1,829,418</u>
3. Employer Normal Cost payable January 1, 2004 (D.1 - D.2 / 1.04)		1,220,757
4. Employer Normal Cost payable in the expected installments* (D.3 adjusted with interest)		\$1,307,225
E. Amortization of Unfunded Actuarial Accrued Liability		
1. UAAL on January 1, 2004 (C.3)		
a. 1992 Early Retirement Incentive Program	\$ 313,520	
b. 2003 Early Retirement Incentive Program	4,611,988	
c. All other Benefits	<u>34,386,234</u>	
d. Total	\$ 39,311,742	
2. Amortization Payments		
a. 1992 Early Retirement Incentive (4 yr., 4.50% incr.)	\$ 82,295	
b. 2003 Early Retirement Incentive (15 yr., 4.50% incr.)	383,318	
c. All other Benefits (22 yr., 4.252% incr.)	2,208,901	
d. Total	2,674,514	
3. Amortization Payment (expected installment dates, E.2.c with interest)	\$ 2,863,953	
F. Pension Appropriation for FY 2005		
1. Normal Cost (D.4)	\$ 1,307,225	
2. Estimated Expenses for FY 2005	128,850	
3. Amortization Payment (E.3)	<u>2,863,953</u>	
4. Total	\$ 4,300,028	

* Payments are expected to be received as follows: 1/12 on July 1, 3/12 each on August 1, November 1, and February 1, and 2/12 on May 1.

Exhibit II

Projected Pension Appropriation

This exhibit shows a projection of the components of the Pension Appropriation from FY 2005 until the year after the Unfunded Actuarial Accrued Liability is completely amortized. All costs shown are computed assuming payments are made using the current timing, with beginning-of-month payments of 1/12 in July, 3/12 each August, November, February, and 2/12 in May.

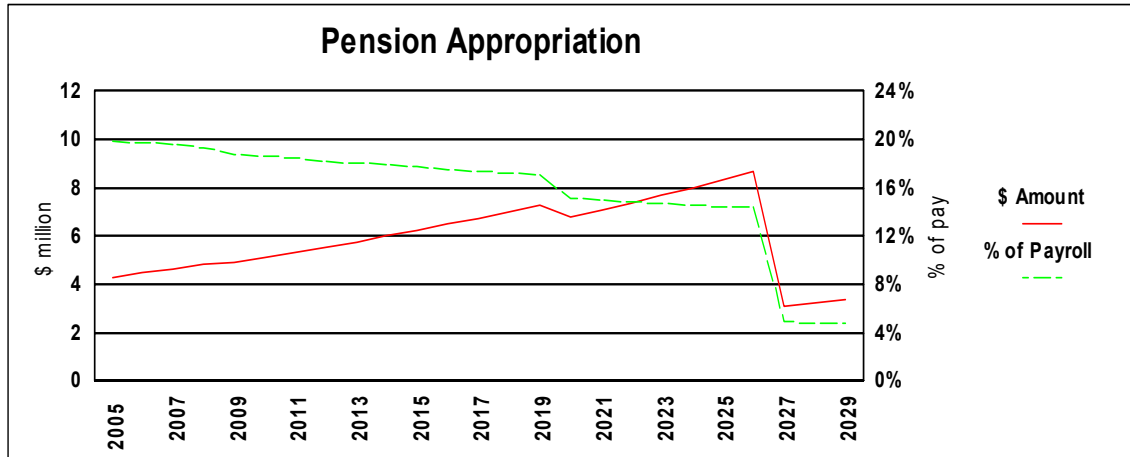
<u>Fiscal Year</u> <u>Ending in</u>	<u>Normal Cost</u>	<u>1992 ERI Amort.</u>	<u>2003 ERI Amort.</u>	<u>Other Amort.</u>	<u>Expenses</u>	<u>Pension Appropriation</u>	<u>Beg. of FY UAAL</u>
2005	1,307,225	88,124	410,469	2,365,360	128,850	4,300,028	40,884,212
2006	1,354,061	92,090	428,940	2,465,935	135,293	4,476,319	41,150,934
2007	1,403,328	96,234	448,242	2,570,787	142,058	4,660,649	41,309,966
2008	1,453,084	100,565	468,413	2,680,097	149,161	4,851,320	41,347,148
2009	1,507,281	0	489,492	2,794,055	156,619	4,947,447	41,246,949
2010	1,556,262	0	511,519	2,912,858	164,450	5,145,089	41,102,576
2011	1,605,271	0	534,537	3,036,713	172,673	5,349,194	40,798,936
2012	1,654,118	0	558,591	3,165,834	181,307	5,559,850	40,316,949
2013	1,704,598	0	583,728	3,300,445	190,372	5,779,143	39,635,737
2014	1,759,458	0	609,996	3,440,780	199,891	6,010,125	38,732,468
2015	1,815,482	0	637,446	3,587,082	209,886	6,249,896	37,582,186
2016	1,874,458	0	666,131	3,739,605	220,380	6,500,574	36,157,633
2017	1,935,123	0	696,107	3,898,613	231,399	6,761,242	34,429,045
2018	1,999,084	0	727,432	4,064,382	242,969	7,033,867	32,363,944
2019	2,065,077	0	760,166	4,237,200	255,117	7,317,560	29,926,902
2020	2,135,408	0	0	4,417,366	267,873	6,820,647	27,079,292
2021	2,209,112	0	0	4,605,192	281,267	7,095,571	24,612,238
2022	2,286,698	0	0	4,801,005	295,330	7,383,033	21,750,808
2023	2,368,301	0	0	5,005,144	310,097	7,683,542	18,455,075
2024	2,454,851	0	0	5,217,963	325,602	7,998,416	14,681,561
2025	2,544,801	0	0	5,439,831	341,882	8,326,514	10,382,939
2026	2,640,449	0	0	5,671,133	358,976	8,670,558	5,507,708
2027	2,740,234	0	0	0	376,925	3,117,159	0
2028	2,845,941	0	0	0	395,771	3,241,712	0
2029	2,956,493	0	0	0	415,560	3,372,053	0

Amortization Payments are based on following:

1992 Early Retirement Incentive:	4 years, 4.5% increase
2003 Early Retirement Incentive:	15 years, 4.5% increase
All other Benefits:	22 years, 4.252% increase

Exhibit II - Continued

Projected Pension Appropriation



Allocation of Fiscal Year 2005 Appropriation by Department

<u>Department</u>	<u>Normal Cost</u>	<u>Amortization</u>			<u>Appropriation</u>	<u>Percentage</u>
		<u>2003 ERI</u>	<u>Other</u>	<u>Expenses</u>		
Schools	245,096	59,703	474,634	24,660	804,093	18.70%
Water	50,147	21,183	135,767	6,370	213,467	4.96%
Wastewater	16,340	52,097	96,007	3,849	168,293	3.91%
Police	369,877	116,446	635,379	34,442	1,156,144	26.89%
Fire	440,785	107,758	712,786	39,524	1,300,853	30.25%
Housing Authority	18,014	0	28,395	1,590	47,999	1.12%
Other	166,966	53,282	370,516	18,415	609,179	14.17%
TOTAL	1,307,225	410,469	2,453,484	128,850	4,300,028	100%

The normal cost was allocated directly for each active member. The amortization of the basic Unfunded Actuarial Accrued Liability was allocated in proportion to the total Actuarial Accrued Liability, and the amortization of the 1992 ERI was allocated in proportion to the Actuarial Accrued Liability for nonactive members. The amortization of the 2003 ERI was calculated directly based on the actual individuals who retired. The expenses were allocated in proportion to the sum of the Normal Cost and the Amortization amounts.

Exhibit III

Actuarial Gain (Loss) Since the 2001 Actuarial Valuation

The actuarial gain or loss represents the effect of deviations from the actuarial assumptions since the prior actuarial valuation. *Gains* result in reduced plan costs; *losses* result in increased costs. We measure the gain or loss by comparing the expected and actual Unfunded Actuarial Accrued Liability.

A. Expected Unfunded Actuarial Accrued Liability

1. Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2001	\$29,698,171
a. 2001 Employer Normal Cost plus expenses	1,997,937
b. 2001 Contribution	(3,939,118)
c. Interest to end of year	2,530,765
2. Expected UAAL, January 1, 2002	30,287,755
a. 2002 Employer Normal Cost plus expenses	2,107,824
b. 2002 Contribution	(4,112,067)
c. Interest to end of year	2,586,506
3. Expected UAAL, January 1, 2003	30,870,017
a. 2003 Employer Normal Cost plus expenses	2,223,754
b. 2003 Contribution	(5,113,966)
c. Interest to end of year	2,641,109
4. Expected UAAL, January 1, 2004	30,620,915

B. Actual Unfunded Actuarial Accrued Liability

1. Actuarial Accrued Liability (before assumption change and ERI)	101,331,498
2. Valuation Assets (Exhibit IV)	66,028,724
3. Actual UAAL, January 1, 2004 (before assumption change) (1 - 2)	35,302,774

C. Actuarial Gain (Loss) as of January 1, 2004 (A.4 - B.3)	\$ (4,681,859)
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Exhibit IV

Valuation Assets as of December 31, 2003

	<u>Market Value</u>
A. Asset Breakdown by Investment Type	
Cash	\$ 6,331,273
Fixed Income	17,546,000
Equities	24,972,236
Pooled Domestic Equity Funds	5,842,813
Pooled International Equity Funds	6,326,282
Pooled Real Estate	3,081,033
Accrued Interest	149,808
Accounts Receivable	1,957,020
Accounts Payable	<u>(177,741)</u>
Total	\$66,028,724
 B. Asset Breakdown by Fund	
1. Annuity Savings Fund	\$16,477,198
2. Annuity Reserve Fund	6,154,752
3. Military Service Fund	0
4. Pension Fund	10,946,934
5. Expense Fund	0
6. Pension Reserve Fund	<u>32,449,840</u>
	\$66,028,724

All figures shown in this exhibit were taken from the December 31, 2003 Annual Statement to PERAC.

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Exhibit IV - Continued

C. Reconciliation of Assets

		Year ending December 31		
		2001	2002	2003
1.	Beginning of year	55,187,055	55,306,315	53,821,400
2.	Receipts			
	City appropriation	4,037,397	4,115,512	4,253,967
	Member contributions	1,780,583	1,867,638	1,899,160
	Payments from other systems	101,206	86,868	63,088
	Payments from Federal Government	261	16,191	1,511
	Payments from Commonwealth	215,506	545,126	378,092
	Interest not refunded	2,908	4,404	2,925
	Total	6,137,861	6,635,739	6,598,743
3.	Disbursements			
	Total of all payments to Members	4,367,102	4,251,326	4,946,707
	Payments to other systems	186,665	53,815	76,119
	Expenses	187,284	165,025	154,534
	Total	4,741,051	4,467,166	5,177,360
4.	Net investment income	(1,277,550)	(3,653,489)	10,785,941
5.	End of year	55,306,315	53,821,400	66,028,724

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Exhibit V

Information on System Membership

Active Members

Active Members

VALN DATE 1/ 1/2004

TABLE 4, ANNUAL EARNINGS BY AGE AND SERVICE GROUPS

SERVICE	0-1	2	3-4	5-6	7-9	10-14	15-19	20-24	25-29	30-34	35-40	OVER	TOTALS
AGE													
0-19	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	7	2	1	0	0	0	0	0	0	0	0	0	10
	145717	60077	31774	0	0	0	0	0	0	0	0	0	237567
	20817	30038	31774	0	0	0	0	0	0	0	0	0	23757
25-29	14	5	10	1	1	0	0	0	0	0	0	0	31
	347946	105740	336008	43298	21249	0	0	0	0	0	0	0	854242
	24853	21148	33601	43298	21249	0	0	0	0	0	0	0	27556
30-34	14	5	9	13	10	7	3	0	0	0	0	0	61
	332563	139643	287020	400052	476888	324902	84745	0	0	0	0	0	2045814
	23754	27929	31891	30773	47689	46415	28248	0	0	0	0	0	33538
35-39	14	4	13	6	12	14	11	1	0	0	0	0	75
	360602	91400	406031	162829	454573	720779	534490	39263	0	0	0	0	2769968
	25757	22850	31233	27138	37881	51484	48590	39263	0	0	0	0	36933
40-44	23	11	20	15	8	16	22	7	0	0	0	0	122
	518230	196222	486324	419755	284239	656694	1100561	359361	0	0	0	0	4021384
	22532	17838	24316	27984	35530	41043	50025	51337	0	0	0	0	32962
45-49	13	12	10	10	13	11	25	17	10	0	0	0	121
	318391	281134	230260	262839	402219	443788	943118	904391	534197	0	0	0	4320337
	24492	23428	23026	26284	30940	40344	37725	53199	53420	0	0	0	35705
50-54	11	8	9	5	10	15	15	9	13	7	0	0	102
	255952	211388	188170	172566	298235	449429	431271	400778	715347	376076	0	0	3499213
	23268	26424	20908	34513	29824	29962	28751	44531	55027	53725	0	0	34306
55-59	6	5	2	5	4	5	8	2	6	7	5	0	55
	122749	180974	68598	111501	97495	135536	259586	74415	300085	450522	361524	0	2162984
	20458	36195	34299	22300	24374	27107	32448	37207	50014	64360	72305	0	39327
60-64	3	0	1	1	3	1	3	3	1	0	1	0	17
	29276	0	21354	20283	64812	56410	101064	101226	22945	0	63456	0	480826
	9759	0	21354	20283	21604	56410	33688	33742	22945	0	63456	0	28284
65+	2	1	3	0	0	1	0	0	2	0	0	1	10
	43609	40942	79809	0	0	24728	0	0	94857	0	0	65138	349083
	21805	40942	26603	0	0	24728	0	0	47429	0	0	65138	34908
TOTAL	107	53	78	56	61	70	87	39	32	14	6	1	604
	2475036	1307520	2135350	1593124	2099710	2812265	3454835	1879433	1667431	826598	424980	6513820741418	
	23131	24670	27376	28449	34421	40175	39711	48191	52107	59043	70830	65138	34340

THE FIRST FIGURE IN EACH GROUP IS THE NUMBER OF MEMBERS IN THAT GROUP. THE SECOND FIGURE IS THEIR ANNUAL PAY. THE THIRD IS THEIR AVERAGE ANNUAL PAY. THE DATA IS CLASSIFIED BY ATTAINED AGE AND COMPLETED YEARS OF SERVICE.

Average Age: 44.8
Average Service: 10.2
Average Valuation Salary (all members): 36,092
Average Annuity Savings Fund Balance: 25,959

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Exhibit V (continued)

Information on System Membership

Terminated Members

	<u>Number</u>	<u>Annuity Savings Fund Balance</u>		<u>Estimated Benefit at Retirement</u>	
		<u>Total</u>	<u>Average</u>	<u>Total</u>	<u>Average</u>
Vested	14	488,448	34,889	167,000	11,929
Non-vested	113	310,003	2,743	n/a	n/a
Total	127	798,451	6,287	n/a	n/a

Members in Pay Status

	<u>Super-annuation</u>	<u>Accidental Disability</u>	<u>Ordinary Disability</u>	<u>Survivors and Beneficiaries</u>	<u>Total</u>
Number	326	40	6	54	426
Average Age	72.3	65.0	68.2	77.1	72.2
Average Benefit	14,700	21,988	13,855	11,567	14,975
Annuity	643,572	50,083	6,660	27,440	727,755
Pension from System	3,822,145	765,345	70,744	540,917	5,259,151
Pension from Other Systems	47,308	0	0	4,567	51,875
COLA from Commonwealth	219,020	64,086	5,728	51,715	340,549
Total	4,792,045	879,514	83,132	624,639	6,379,330

Distribution of Benefit by Age

<u>Present Age</u>	<u>Number</u>	<u>Total Benefit</u>	<u>Average Benefit</u>
less than 45	2	19,971	9,986
45-49	5	129,239	25,848
50-54	9	297,740	33,082
55-59	47	1,257,485	26,755
60-64	48	935,915	19,498
65-69	67	1,004,651	14,995
70-74	70	999,545	14,279
75-79	71	804,105	11,325
80-84	53	503,644	9,503
85-89	39	319,147	8,183
90 and older	15	107,888	7,193
	426	\$6,379,330	\$14,975

Due to rounding, numbers may not add up exactly.

Exhibit VI

GASB Statement No. 25 Required Schedules

Paragraphs 37 and 38 of the Statement require two schedules of historical information.

A. Schedule of Funding Progress

1. <u>Actuarial Valuation Date</u>	01/01/2004	01/01/2001	01/01/1998	01/01/1995	01/01/1992
2. Actuarial Value of Plan Assets	66,028,724	55,187,055	40,837,836	24,337,698	20,092,680
3. Actuarial Accrued Liability	105,340,466	84,885,226	69,407,224	51,002,000	41,732,515
4. Unfunded Actuarial Accrued Liability (UAAL)	39,311,742	29,698,171	28,569,388	26,664,302	21,639,835
5. Funded Ratio	63%	65%	59%	48%	48%
6. Annual Covered Payroll	21,799,607	20,608,634	16,441,243	12,779,325	10,527,926
7. Ratio of UAAL to Covered Payroll	180%	144%	174%	209%	206%

B. Schedule of Employer Contributions

1. <u>Fiscal Year Ending</u>	6/30/2005	6/30/2004	6/30/2003	06/30/2002	06/30/2001
2. Actuarially Required Contribution	4,300,028	4,292,090	4,112,067	3,939,118	3,928,651
3. Contribution Made	n/a	4,253,966	4,112,067	3,939,118	3,928,651
4. Ratio	n/a	99%	100%	100%	100%

Exhibit VI - Continued

B. Schedule of Employer Contributions (Cont.)

1. <u>Fiscal Year Ending</u>	06/30/2000	06/30/1999	06/30/1998	06/30/1997
2. Actuarially Required Contribution	3,787,691	3,652,510	3,395,921	2,875,635
3. Contribution Made	3,787,691	3,647,606	3,400,825	2,875,635
4. Ratio	100%	100%	100%	100%

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Exhibit VII

Summary of Plan Provisions

Employee Contributions

Rate: 5%, 7%, 8% or 9%, depending on hire date (1/1/75, 1/1/84, 7/1/96 cutoffs).

Since the \$30,000 cap on Compensation was repealed by the System, members who joined after January 1, 1979 are required to make extra contributions equal to 2% of compensation in excess of \$30,000.

Retirement

Eligibility: Earlier of 20 years of service or age 55. If hired after January 1, 1978, the member must have at least 10 years of service to retire, even if over 55.

Benefit: Benefit Rate x Creditable Service x Average Annual Pay.
Maximum benefit is 80% of Average Annual Pay
Benefit rate is 2.5%, grading down by .1% per year less than age 65 (group 1) or age 55 (group 4).
Average Annual Pay is based on the highest 3 consecutive years.
Veterans get extra annual benefit equal to \$15 x years of service up to 20.

Vesting

Eligibility: 10 years

Benefit: Retirement Benefit with Benefit Rate based on age the member begins to receive benefits.

Disability - Ordinary

Eligibility: Non Veterans: 10 years
Veterans: 10 years

Benefit: Benefit Rate x Creditable Service x Average Annual Pay
Maximum is 80% of Average Annual Pay
Pay is capped in same manner as for Retirement Benefit
For *members under age 55*, Benefit Rate for age 55 is used.
For *veterans*, minimum benefit is the sum of the annuity purchasable by accumulated employee contributions, plus 50% of prior year's pay.

Exhibit VII (continued)

Disability - Accidental (Job Related)

Eligibility: Immediate

Benefit: Sum of annuity purchasable by accumulated employee contributions plus pension equal to 72% of rate of pay, not to exceed 100% of pay.

Death - Ordinary

Eligibility: 2 years

Benefit: Benefit Rate x Creditable Service x Average Annual Pay x Option C reduction x $\frac{2}{3}$
Benefit is payable for *life of the spouse*
For members *under age 55*, Benefit Rate for age 55 is used.
Minimum Benefit = \$3,000 per year

Death - Accidental (Job Related)

Eligibility: Immediate

Benefit: Sum of annuity purchasable by accumulated employee contributions, plus pension equal to 72% of rate of pay.

Veterans' Buy Back

Veterans who become vested may purchase up to 4 years of credit for combat duty in the military within 180 days following the date that they vest under the System. Payment of 10% of the compensation at the time the member joined the System must be made for each year to be credited.

Cost of Living Adjustment

Each year, the Legislature may choose to grant a cost of living adjustment to the first \$12,000 of benefit. If the System is sponsored by a municipality, adjustments after 1981 were paid for by the Commonwealth via the State Retirement System.

Beginning in 1998, adjustments are no longer paid by the Commonwealth. The System may elect to accept provisions which make it responsible to pay (and fund for) future cost of living adjustments. The System has adopted these provisions.



Exhibit VIII

Actuarial Cost Method, Assumptions and Techniques

Actuarial Cost Method

This valuation was prepared using the Entry Age Normal Actuarial Cost Method. Under this method, a level Normal Cost rate is developed for each individual to fund all expected benefits over the participant's career. The Normal Cost is the portion of the present value of expected benefits which the method allocates to the current year. The Actuarial Accrued Liability is the portion of the value of benefits which is allocated to past years and is equal to the hypothetical accumulation of past Normal Costs. The Actuarial Accrued Liability for non-active participants or those assumed to retire on the valuation date is equal to their total present value of benefit.

The excess of the Actuarial Accrued Liability over assets in the plan is called the Unfunded Actuarial Accrued Liability (UAAL), which is amortized over a period of time which depends on the type of funding schedule adopted.

The total cost for the year is equal to the Normal Cost, less expected employee contributions for the year, plus the amortization payment toward the Unfunded Actuarial Accrued Liability and an allowance for anticipated administrative expenses.

Differences between the actual experience of the Plan and the experience projected by the actuarial assumptions result in changes in the Unfunded Actuarial Accrued Liability. An increase results in an Actuarial Loss, and a decrease is called an Actuarial Gain. These amounts are amortized over a period which depends on the funding schedule adopted.

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Exhibit VIII (continued)

Summary of Actuarial Assumptions

Economic Assumptions

1. Investment Return: 8.0%
2. Salary increases: Rates developed by PERAC in their 2002 Local Experience Study.
(Prior assumption was 5.5%.)

<u>Years of Service</u>	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
0	7.00%	7.00%	8.00%
1	6.50%	6.50%	7.50%
2	6.50%	6.50%	7.00%
3	6.00%	6.00%	6.50%
4	6.00%	6.00%	6.00%
5	5.50%	5.50%	6.00%
6	5.50%	5.50%	5.50%
7	5.00%	5.00%	5.50%
8	5.00%	5.00%	5.25%
9	4.75%	5.00%	5.25%
10+	4.75%	5.00%	5.25%

3. Interest rate credited to the Annuity Savings Fund (on Employee Contribution Accumulations): 4.0%

Demographic Assumptions

1. Mortality Other Than Disabled (pre and post retirement):

Pre-retirement: RP-2000 Employees Table

Post-retirement: RP-2000 Healthy Annuitant Table

(Prior assumption was the 1994 Group Annuity Mortality Static Table.)

2. Disabled Mortality (pre and post retirement):

Healthy Post-retirement rates set forward two years. For occupational disabilities, 40% of post disability deaths are assumed to be from the same cause as the disability. *(Prior assumption was the healthy post-retirement table set forward ten years.)*



Exhibit VIII (continued)

3. Termination rates: Rates developed by PERAC in their 2002 Local Experience Study Analysis. Rates are based on service. *(Prior rates were based on age.)*

Prior Rates (samples)

<u>Age</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
20	0.0794	0.0000
30	0.0722	0.0000
40	0.0515	0.0000
50	0.0256	0.0000
60	0.0009	0.0000

Revised Rates

<u>Service</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
0	0.150	0.015
1	0.120	0.015
2	0.100	0.015
3	0.090	0.015
4	0.080	0.015
5	0.076	0.015
6	0.075	0.015
7	0.067	0.015
8	0.063	0.015
9	0.059	0.015
10	0.054	0.015
11	0.050	0.000
12	0.046	0.000
13	0.041	0.000
14	0.037	0.000
15	0.033	0.000
16-20	0.020	0.000
21-29	0.010	0.000
30	0.000	0.000

3. Disablement rates: Rates developed by PERAC in their 2002 Local Experience Study Analysis. (Prior rates were PERAC standard rates, with Group 4 rates doubled.)

<u>Age</u>	<u>Revised Rates</u>		<u>Prior Rates (Samples)</u>	
	<u>Groups 1 and 2</u>	<u>Group 4</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
20	0.0010	0.0000	0.0006	0.0024
30	0.0030	0.0030	0.0011	0.0044
40	0.0101	0.0030	0.0024	0.0096
50	0.0192	0.0125	0.0061	0.0244
60	0.0280	0.0085	0.0123	0.0491

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Exhibit VIII (continued)

5. Retirement rates: Rates developed by PERAC in their 2002 Local Experience Study Analysis

Age	<u>Revised Rates</u>			<u>Prior Rates</u>	
	<u>Groups 1 and 2</u>		<u>Group 4</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
	<u>Male</u>	<u>Female</u>			
45	0.000	0.000	0.010	0.0000	0.0000
46	0.000	0.000	0.010	0.0000	0.0000
47	0.000	0.000	0.010	0.0000	0.0000
48	0.000	0.000	0.010	0.0000	0.0000
49	0.000	0.000	0.010	0.0000	0.0000
50	0.010	0.015	0.020	0.0000	0.1000
51	0.010	0.015	0.020	0.0000	0.0200
52	0.010	0.020	0.020	0.0000	0.0200
53	0.010	0.025	0.050	0.0000	0.0200
54	0.020	0.025	0.075	0.0000	0.0200
55	0.020	0.055	0.150	0.1000	0.2500
56	0.025	0.065	0.100	0.0500	0.0500
57	0.025	0.065	0.100	0.0500	0.0500
58	0.050	0.065	0.100	0.0500	0.0500
59	0.065	0.065	0.150	0.0500	0.0500
60	0.120	0.050	0.200	0.0500	0.2500
61	0.200	0.130	0.200	0.0500	0.0500
62	0.300	0.150	0.250	0.2500	0.0500
63	0.250	0.125	0.250	0.1000	0.0500
64	0.220	0.180	0.300	0.1000	0.0500
65	0.400	0.150	1.000	0.1000	1.0000
66	0.250	0.200	1.000	0.1000	1.0000
67	0.250	0.200	1.000	1.0000	1.0000
68	0.300	0.250	1.000	1.0000	1.0000
69	0.300	0.200	1.000	1.0000	1.0000
70	1.000	1.000	1.000	1.0000	1.0000

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Exhibit VIII (continued)

6. Age that Deferred Vested Benefits commence: 65
7. Percentage Married: 100% of males, 100% of females, females three years younger than males.
8. Assumptions for children, remarriages: none
9. Percentage of deaths and disabilities assumed occupational:
Groups 1 and 2: 55%, Group 4: 90%.
10. Expenses: Estimated administrative expenses are added to the Pension Appropriation.
11. Cost of Living: Cost of living increases granted prior to July 1, 1981 are included in the calculations. Cost of living adjustments from 1981 through 1997 are assumed to be paid by the Commonwealth. It is assumed that each year in the future, there will be an adjustment of 3%, borne by the System.

Actuarial Procedures and Techniques

Employee Data

Employee data used was derived from diskettes provided by the City, supplemented by verbal and written clarification of questions. Data was examined for completeness and consistency.

Active Members' dates of hire were based on reported total credited service.

No information was available on transfers to other systems who have not yet retired. It is implicitly assumed that the liability of this system is offset by other systems' liability for employees who have transferred to this system.

Asset Data

Assets were reported as of December 31, 2003.

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Exhibit VIII (continued)

Adjustment and Projection of Liability Results

Liability calculations (present values, accrued liabilities, normal costs) were made as of January 1, 2004, the census date.

Normal Cost was projected each year by applying the assumed salary increase to the total normal cost and subtracting the projected employee contributions for the year. The projected employee contributions are equal to the projected contributions for the closed group of current participants plus an estimated contribution rate applied to the projected salary for new entrants. The projected salary for new entrants is the amount necessary for total payroll to increase at the assumed salary increase (after considering projected payroll for the closed group of current members). The estimated contribution rate is the rate of a newly hired employee earning the average salary for new entrants. This average salary is projected to increase each year by the assumed salary increase. The net effect of this technique is that the employee contribution, as a percentage of total payroll, will increase by about 1.0% every 10 or 11 years, slowing down as it approaches 10.2% by 2028.

Expenses are projected to increase by 5% per year.

All January 1 results were adjusted with interest to reflect the scheduled payments in July, August, November, February and May.

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Exhibit IX

Glossary Of Terms

Actuarial Accrued Liability -- That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions -- In order to fund a plan with reasonably level contributions, one must anticipate the plan's future experience. The actuary does this with a combination of actuarial assumptions, which represent his or her best estimate of future experience. Assumptions for pension plans include estimates of asset appreciation, member turnover, salary increases, pre-retirement mortality, and the cost of an annuity at retirement. The combination of assumptions is intended to reasonably represent a plan's future financial experience over the long term.

Actuarial Cost Method (Or Funding Method) -- A procedure for allocating the Actuarial Present Value of all expected pension plan benefits between past and future time periods. This is done via calculation of the Normal Cost and the Actuarial Accrued Liability. Over the years, actuaries have developed various approaches for the systematic accumulation of assets sufficient to provide plan benefits. These approaches or cost methods differ in many respects: some spread costs over an average working lifetime of a group, others spread an individual's cost over that individual's working lifetime; some accumulate assets quickly, others take longer to accumulate sizable assets. The choice of a cost method depends on such factors as the size of the plan and the type of benefit promised.

Entry Age Normal Actuarial Cost Method - Spreads cost for each individual as level percentage of pay. Required under MGL Chapter 32 to develop a Funding Schedule amount.

Actuarial Gain Or Loss (Or Experience Gain Or Loss) -- A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Differences due to changes in the Actuarial Assumptions, the Actuarial Cost Method or pension plan provisions would be described as such, rather than as an Actuarial Gain(Loss).

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Exhibit IX (continued)

Actuarial Present Value Of Benefits -- The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan, taking into account appropriate discounts for the time value of money and the probability that the benefits will be paid.

Actuarial Valuation -- An estimation of the present value of future benefits expected to be provided by a Retirement System, and the allocation of this value between past and future periods. The current year's funding requirement is determined, based on data on existing employees and pensioners in the System, using Actuarial Assumptions and an Actuarial Cost Method, as well as a procedure to determine the amortization payment to be used in the funding schedule.

Amortization Payment -- That portion of the pension plan appropriation which represents payments made to pay interest on and to reduce the Unfunded Actuarial Accrued Liability. Payments can either be "Level" (fixed amount each year), or "Increasing" (amount calculated on the basis that it will increase each year at no more than 4.5%).

Annual Statement -- The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Savings Fund -- The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Annuity Reserve Fund -- The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Assets -- The total value of the Annuity Savings Fund, Annuity Reserve Fund, Military Service Credit Fund, Pension Fund and Pension Reserve Fund held on behalf of the Retirement System. For valuation purposes, the Expense Fund is not considered an asset.

Cost Of Benefits -- The estimated payment from the pension system for benefits for the fiscal year. This is the minimum amount payable during the first six years of a Funding Schedule under Sections 22(6A) and 22D of MGL Chapter 32.

Expense Fund -- The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.



Exhibit IX (continued)

Funding Schedule -- The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22 6A of MGL Chapter 32.

GASB -- Governmental Accounting Standards Board

Normal Cost -- Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is allocated to a particular fiscal year. The Employer Normal Cost is the difference between the total Normal Cost and the amount of the expected employee contributions for the fiscal year.

Pension Fund -- The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund -- The fund which is credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts include excess interest earnings.

PERAC -- The Commonwealth of Massachusetts Public Employee Retirement Administration Commission, which oversees all the contributory retirement systems established under MGL Chapter 32.

Salary Cap -- The \$30,000 limit on compensation considered by the System for benefit purposes for members hired after 1978, unless the System has elected to remove this cap.

Unfunded Actuarial Accrued Liability -- The excess of the Actuarial Accrued Liability over the Assets.

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Appendix

Quick Reference Summary

	<u>2004 Valuation</u>	<u>2001 Valuation</u>
Number of Participants (Exh. V)		
Active	604	624
Retired	380	323
Disabled	46	51
Terminated Vested	14	8
Terminated Non-vested	<u>113</u>	<u>88</u>
Total	1,157	1,094
Active Members		
Average Age	44.8	44.3
Average Service	10.2	10.6
Reported Payroll (all members)	\$ 20,741,418	\$ 19,534,250
Valuation Payroll (all members)	21,799,607	20,608,634
(members below retirement age)	21,630,234	19,634,179
Average Valuation Pay (all members)	\$ 36,092	\$ 33,027
Retired and Disabled Members		
Average age	72.2	72.4
Average Benefit	\$ 14,975	\$ 11,613
Employer Normal Cost, payable according to the expected schedule (Exh. I, excluding expenses)		
Dollar Amount	\$ 1,307,225	\$ 1,964,171
Percentage of Valuation Pay	6.0%	9.5%
Actuarial Accrued Liability (Exh. I)		
Active Members	\$ 45,461,073	\$ 46,550,729
Retirees	48,224,893	28,851,383
Disabled Members	10,422,520	8,671,709
Terminated Vested	921,977	602,568
Terminated Not Vested	310,003	208,837
Total	\$ 105,340,466	\$ 84,885,226
Valuation Assets (Exh. IV)	\$ 66,028,724	\$ 55,187,055
Unfunded Actuarial Accrued Liability (Exh. I)	\$ 39,311,742	\$ 29,698,171
Funded Percentage	62.7%	65.0%
Pension Appropriation for FY2005 (Exh. II)		
Dollar Amount	\$ 4,300,028	\$ 4,477,718
Percentage of Valuation Pay	19.9%	18.5%

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